

CHAPTER 2. BASIN CHARACTERISTICS

2.1 DRAINAGE BASIN

2.1.1 Subbasin Boundaries and Characteristics

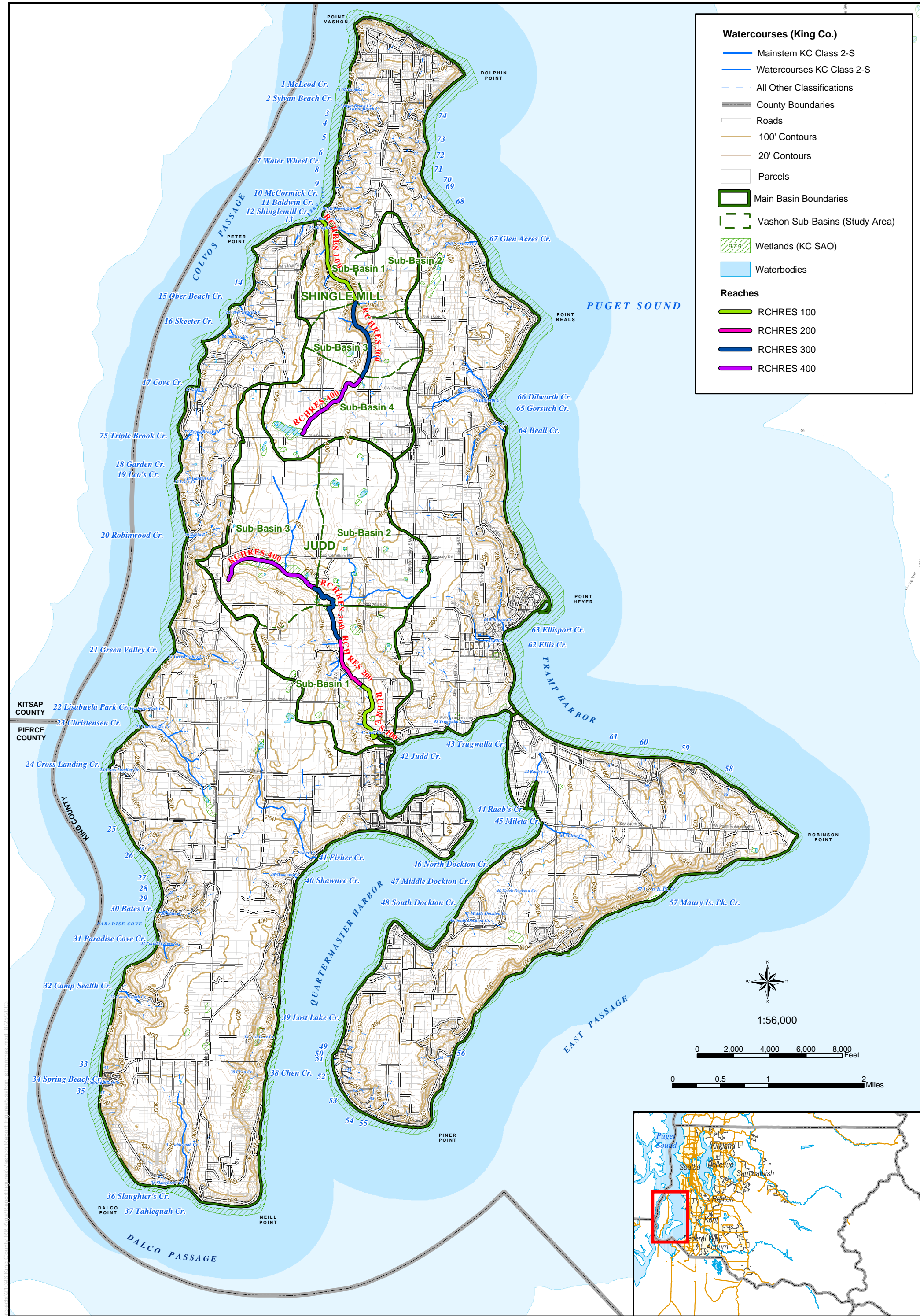
A detail investigation of all of Vashon-Maury Island could not be made at this time because of budgetary constraints. Judd Creek and Shinglemill Creek basins were selected for a detail investigation because they are the largest basins on the island and are experiencing the most growth problems.

Judd Creek and Shinglemill Creek basins were subdivided into a total of seven subbasins, three in the Judd Creek Basin and four in the Shinglemill Creek Basin. These were delineated based on available topographic information and discussion with King County staff on critical areas where simulated flow rates needed to be evaluated. Figure 2-1 shows the subbasins and stream reaches used for the basin characterization of Judd Creek and Shinglemill Creek. There are approximately 30,300 feet of Class 2 stream in the Judd Creek basin and approximately 19,000 feet in Shinglemill Creek basin. Table 2-1 summarizes the area of each of the subbasins.

| TABLE 2-1. VASHON-MAURY ISLAND SUBBASIN AREAS | |
|--|----------------------|
| Subbasin | Area (acres/Sq. Mi.) |
| Judd Creek Basin | |
| 1 | 1,080 |
| 2 | 998 |
| 3 | 1,214 |
| Total | 3,292/5.14 |
| Shinglemill Creek Basin | |
| 1 | 316 |
| 2 | 310 |
| 3 | 419 |
| 4 | 801 |
| Total | 1,846/2.88 |
| Vashon & Maury Island Area is 36.7 square miles | |

Judd Creek Subbasin 1

Judd Creek Subbasin 1 is the most downstream subbasin in the Judd Creek Basin and covers 1,080 acres. Elevation in the subbasin ranges from sea level at the creek's outfall into Puget Sound to about 140 feet near 107th and 216th). The creek forms the central corridor with steeply rising land on both sides. Due to channel variability, the creek was divided into three segments in this subbasin. Judd Creek's slope ranges from about 1.6 to 2.4 percent in Subbasin 1 and has approximately 12,500 feet of Class 2 stream.



Judd Creek Subbasin 2

Of the three Judd Creek subbasins, Subbasin 2, the 998-acre drainage area of a tributary to Judd Creek, has the most cleared land and development. Elevation varies from about 140 feet to 400 feet. There is approximately 7,600 feet of Class 2 stream in Subbasin 2.

Judd Creek Subbasin 3

Judd Creek Subbasin 3 covers 1,214 acres in the west-central portion of the basin. This subbasin contains a large wetland area that forms the headwaters to Judd Creek. It is a hilly area varying in elevation from about 180 feet to about 440 feet. This subbasin presently contains the largest forest coverage and approximately 10,200 feet of Class 2 stream. SW Cemetery Road crosses east to west through the lower third of the subbasin. The wetland portion has about a 0.5-percent longitudinal slope as it drains west to form Judd Creek.

Shinglemill Creek Subbasin 1

Shinglemill Creek Subbasin 1 covers 316 acres and includes the outfall of Shinglemill Creek as it flows into Puget Sound at Fern Cove. The subbasin is mostly forested and contains the creek in a broad and deeply incised, well-established valley. The channel through this area has a slope of about 1.3 percent and there is approximately 6,600 feet of Class 2 stream. Elevation ranges from sea level to about 420 feet. Significant overbank flooding may occur along this channel reach. Due to the steep valley walls, most development has occurred along the upper fringes of this subbasin.

Shinglemill Creek Subbasin 2

Shinglemill Creek Subbasin 2 covers 310 acres and represents the drainage area of a tributary to Shinglemill Creek. Except for the ravine created by the tributary, this subbasin is relatively flat. There is approximately 2,200 feet of Class 2 stream. Much of the flat area has been cleared for agriculture and other development. Elevation varies from about 120 feet to about 400 feet. Minor residential streets lie within the subbasin. Just outside the subbasin boundary are Vashon Highway SW and SW 156th Street.

Shinglemill Creek Subbasin 3

Shinglemill Creek Subbasin 3 is 419 acres and covers about the center third of the basin. Shinglemill Creek flows through the center of this subbasin through a deep valley of about 140 feet. There is approximately 5,000 feet of Class 2 stream in Subbasin 3. Outside the valley, the subbasin rises slowly to the basin divide on the east and west. Toward the upper end of the subbasin, the creek rises rapidly and the deep valley disappears. Elevation varies from 140 feet to about 420 feet. The central third of the subbasin, primarily around the creek corridor, is forested. The rest of the subbasin has been largely cleared for agriculture and other development. 115th Avenue SW passes through the eastern portion of the subbasin. The channel slope through this area averages about 1.9 percent.

Shinglemill Creek Subbasin 4

Shinglemill Creek Subbasin 4 is 801 acres and is the most southern portion of the basin, representing the headwaters of Shinglemill Creek. A wetland and pond area, identified as Frenchmans Pond, is the upper limit of Shinglemill Creek. Major roads through this subbasin include 115th Avenue SW and SW Cove Road. The topography of this subbasin is relatively flat, with the creek forming a small channel. The elevation varies from 240 feet to 420 feet. Of the four subbasins forming the Shinglemill Creek watershed, this subbasin has the greatest removal of trees for agriculture and other development. There is

approximately 5,200 feet of Class 2 stream in this subbasin. The channel slope through this area averages about 1.6 percent.

2.1.2 Stream Reaches

Judd Creek and Shinglemill Creek were divided into four and three segments, respectively, for use in the HSPF model of the basins. Judd Creek in Subbasin 1 was divided into three segments to represent its channel variability through that subbasin. These three segments were assigned the HSPF reference numbers (“RCHRES” numbers) of 100, 200 and 300 (from downstream to upstream). The wetland area in Subbasin 3 was designated RCHRES 400 and modeled using HEC-RAS, with the culvert under 115th Avenue SW as the downstream control. The other channel segments used compound channel sections with normal flow assumptions.

In Shinglemill Creek, one segment was defined per subbasin, except in Subbasin 2, which contains a tributary to Shinglemill Creek and for which no channel segment was modeled. All channel segments represent the main stem of Judd Creek. The channel segments used compound channel sections with normal flow assumptions to estimate channel routing characteristics.

Channel geometry for each RCHRES was defined based on available information, including topographic mapping and a site visit. No field survey was conducted to determine actual cross-section. Table 2-2 summarizes key information for each segment. Figures 2-3 and 2-4 depict the RCHRES routing and subbasin inflows used in the Judd Creek and Shinglemill Creek HSPF models, respectively.

2.2 LAND COVER ANALYSIS

Adolfson Associates used GIS analysis to compute the pervious (PERLND) and impervious (IMPLND) land cover area in each subbasin for the HSPF model. Figure 2-2 shows the 2001 land cover information. The pervious input parameter represents a composite of land cover type, soils, and topography. The impervious areas are based on an effective impervious area (EIA) being applied to each of the land cover types. All data used was provided by King County. Data shape files used to compile land surface types were clipped to the boundaries of the Judd Creek and Shinglemill Creek subbasins.

2.2.1 Land Cover

Land cover in the basins includes the following categories:

- Urban/High Density Developed
- Mixed Urban/Low Density Developed
- Water
- Bare Earth
- Conifer Forest

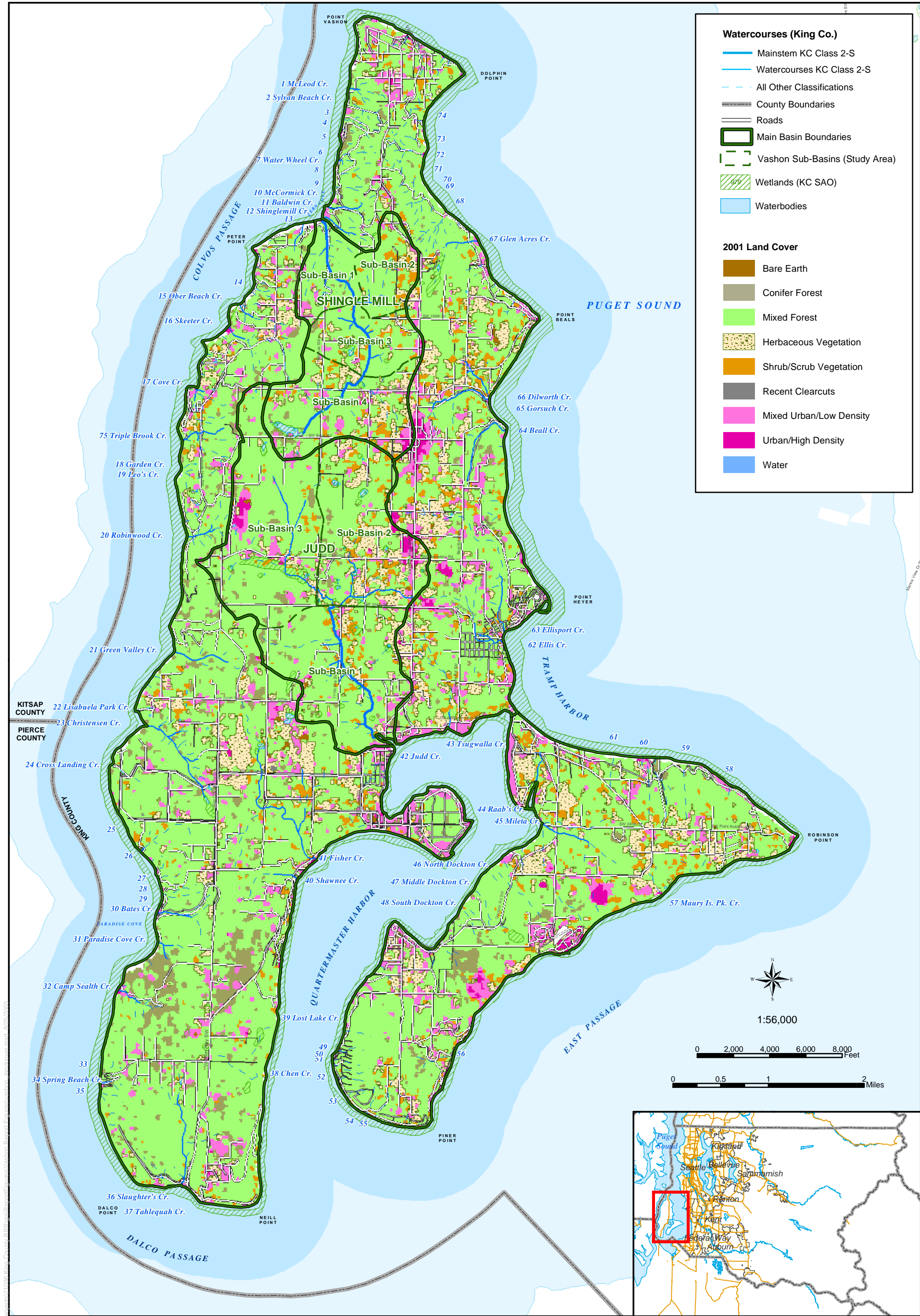


TABLE 2-2.
JUDD AND SHINGLEMILL CREEK RCHRES CHARACTERISTICS

| RCHRES Number | Subbasin | Primary Channel Geometry (feet) ^a | Notes ^b |
|--------------------------|----------|--|--|
| Judd Creek | | | |
| 100 | 1 | 3x8x1 | |
| 200 | 1 | 3x10x1 | |
| 300 | 1 | 2x5x1 | |
| 400 | 3 | 4x2x1 | Wetland floodplain storage included |
| Shinglemill Creek | | | |
| 100 | 1 | 3x34x1 | Broad floodplain included in channel cross-section |
| 300 | 3 | 0.5x4x0 | |
| 400 | 4 | 1x4x1 | |

a. Compound channel sections were used. The low-flow channel portion is summarized here. It is a trapezoidal channel, whose dimensions represent depth, base width and side-slope ratio (horizontal to vertical).

b. If required, all channels were extended to convey predicted flood flows by extended the side slopes with the exception of the noted channels where field observation indicated likely significant floodplain storage.

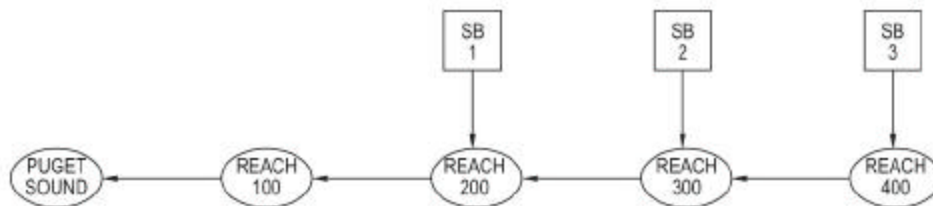


Figure 2-3. Judd Creek Graphic Representation of RCHRES Routing

- Deciduous Forest
- Mixed Forest
- Recent Regenerated Forest
- Recent Clear Cut
- Herbaceous Vegetation
- Shrub/Scrub Vegetation

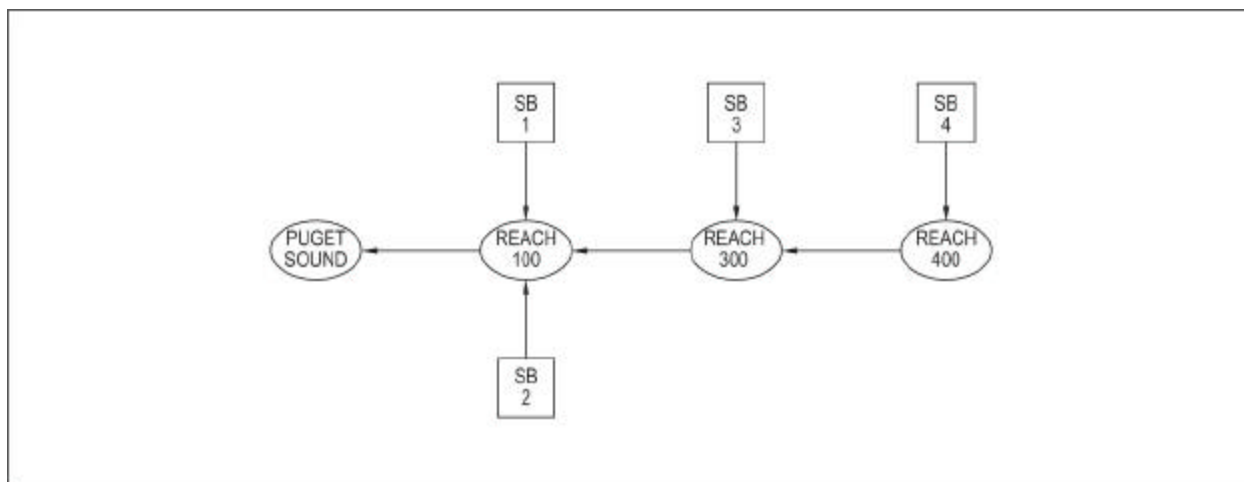


Figure 2-4. Shinglemill Creek Graphic Representation of RCHRES Routing

The GIS land cover types were converted to equivalent HSPF classifications using the equivalencies shown in Table 2-3, which was provided by King County. Table 2-4 lists the EIA defined for each land cover type, as provided by King County and modified by the design team to represent characteristics of the Vashon Island drainage basins.

Future-condition impervious area was determined by assuming full development to the density allowed by existing zoning. Table 2-5 lists the EIA for each zoning category, as provided by King County. The zoning map is shown in Figure 2-5.

2.2.2 Soils

Table 2-6 lists the GIS soil type and the associated HSPF soil type. The soils map is shown in Figure 2-6. GIS soils data was verified by checking it against the hard copy NRCS Soil Survey maps.

2.2.3 Topography

Table 2-7 correlates the percent slope provided by King County to an equivalent HSPF slope category. Topography is shown in Figure 2-7.

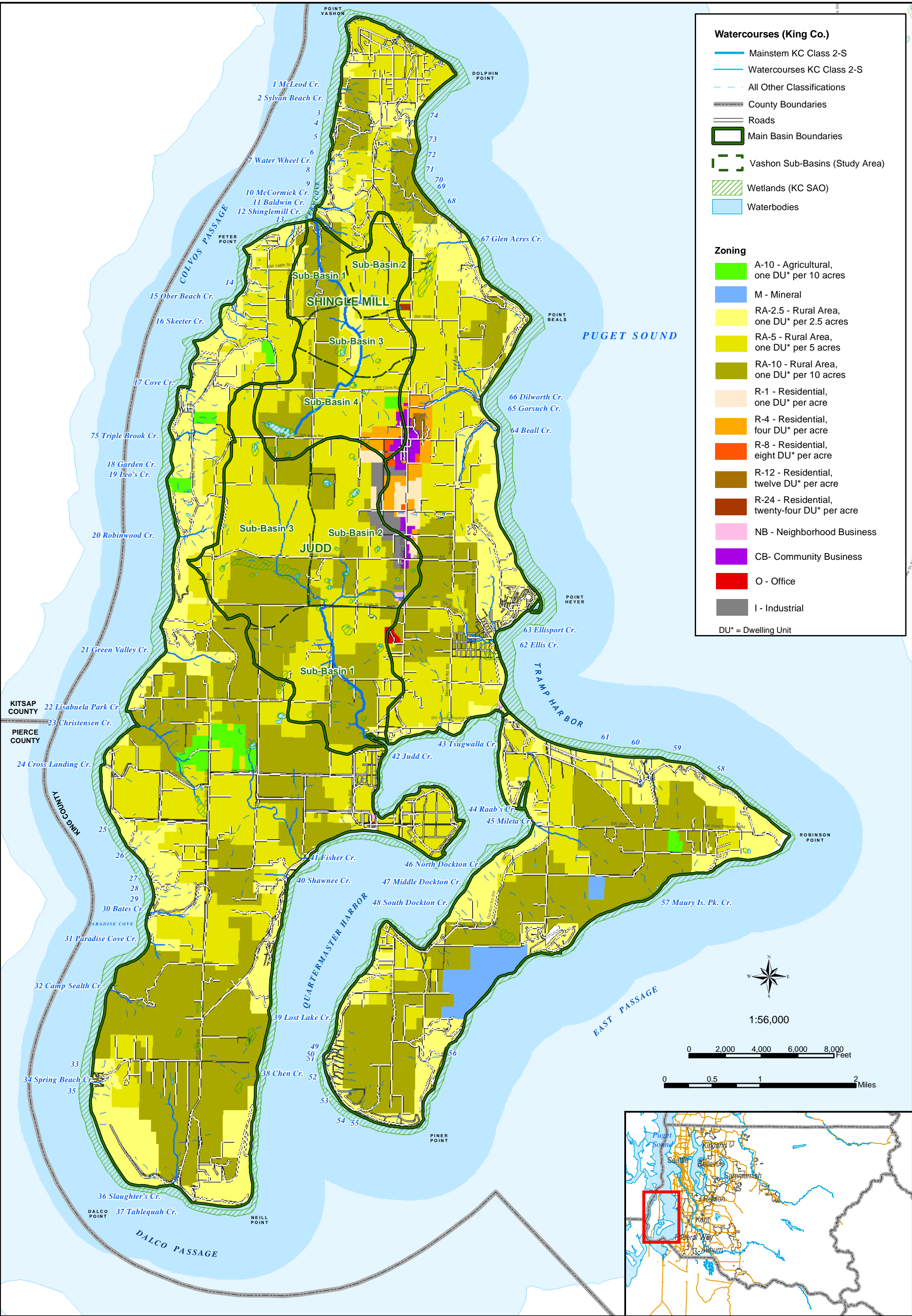
2.2.4 GIS Analysis

GIS overlay analysis of land cover, soil and slope was used to generate an HSPF land surface type layer. The HSPF land surface type layer was then overlaid with the Judd Creek and Shinglemill Creek subbasin layer.

There is a potential for 165 unique land surface types (combinations of land cover, soil type and slope). Table 2-8 summarizes the number of unique land surface types in each subbasin. The types were aggregated into the 13 HSPF land surface types listed in Table 2-9.

TABLE 2-3.
LAND COVER TYPE EQUIVALENCY FOR HSPF

| Land Cover Type | HSPF Pervious Land Cover Type |
|-----------------------------------|-------------------------------|
| Urban/High Density Developed | 90% Grass & 10% Forest |
| Mixed Urban/Low Density Developed | 90% Grass & 10% Forest |
| Bare Earth | Grass |
| Conifer Forest | Forest |
| Deciduous Forest | Forest |
| Mixed Forest | Forest |
| Herbaceous Vegetation | Pasture |
| Shrub/Scrub Vegetation | Pasture |



- Watercourses (King Co.)**
- Mainstem KC Class 2-S
 - Watercourses KC Class 2-S
 - All Other Classifications
 - County Boundaries
 - Roads
 - Main Basin Boundaries
 - Vashon Sub-Basins (Study Area)
 - Wetlands (KC SAO)
 - Waterbodies

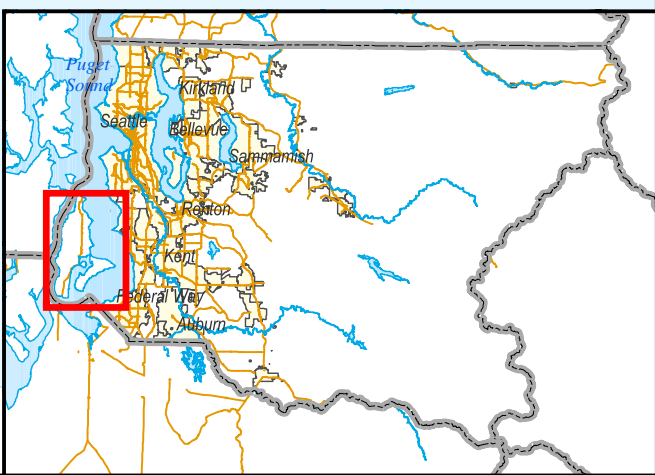
- Zoning**
- A-10 - Agricultural, one DU* per 10 acres
 - M - Mineral
 - RA-2.5 - Rural Area, one DU* per 2.5 acres
 - RA-5 - Rural Area, one DU* per 5 acres
 - RA-10 - Rural Area, one DU* per 10 acres
 - R-1 - Residential, one DU* per acre
 - R-4 - Residential, four DU* per acre
 - R-8 - Residential, eight DU* per acre
 - R-12 - Residential, twelve DU* per acre
 - R-24 - Residential, twenty-four DU* per acre
 - NB - Neighborhood Business
 - CB- Community Business
 - O - Office
 - I - Industrial
- DU* = Dwelling Unit

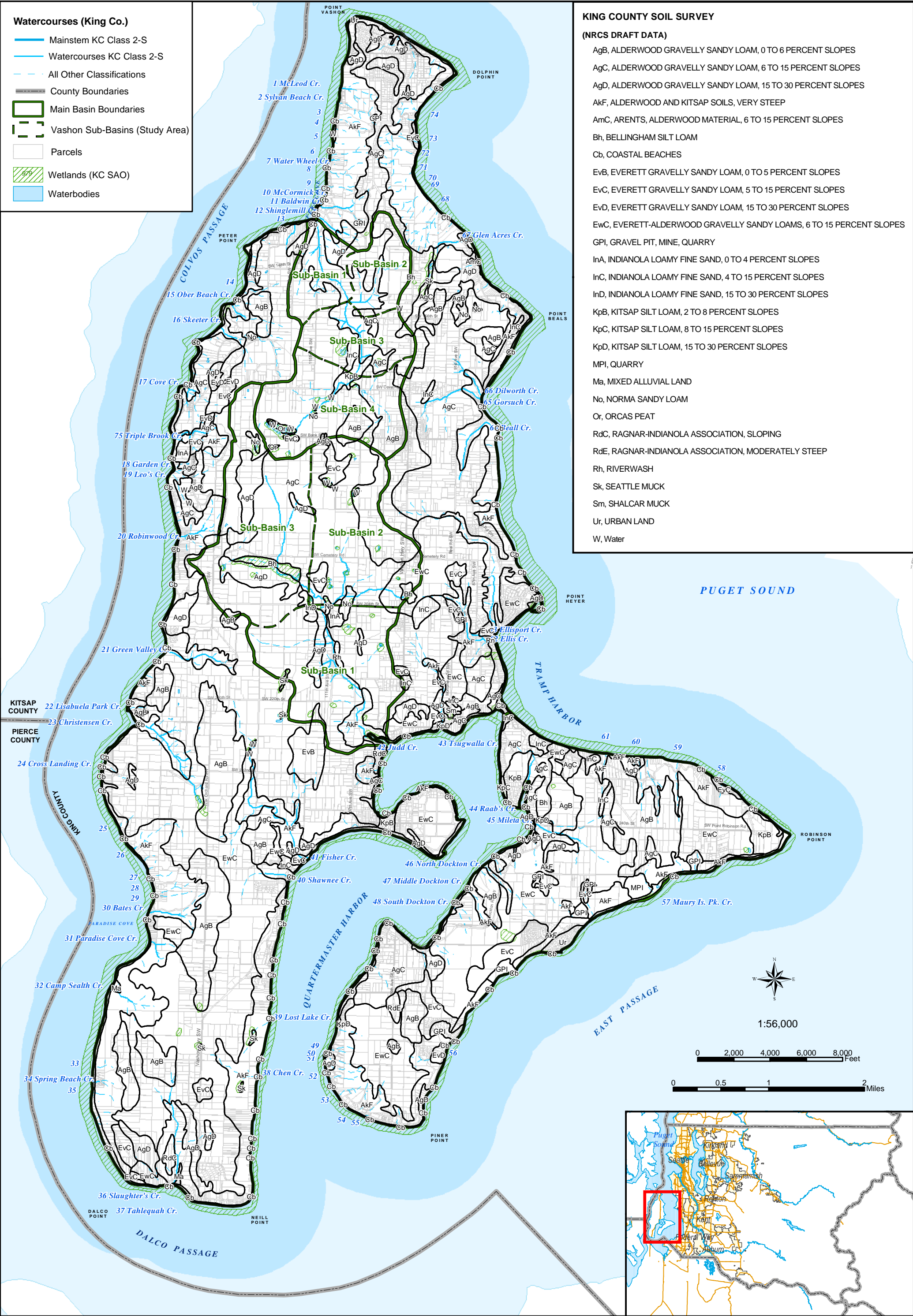


1:56,000

0 2,000 4,000 6,000 8,000 Feet

0 0.5 1 2 Miles





KING COUNTY SOIL SURVEY

(NRCS DRAFT DATA)

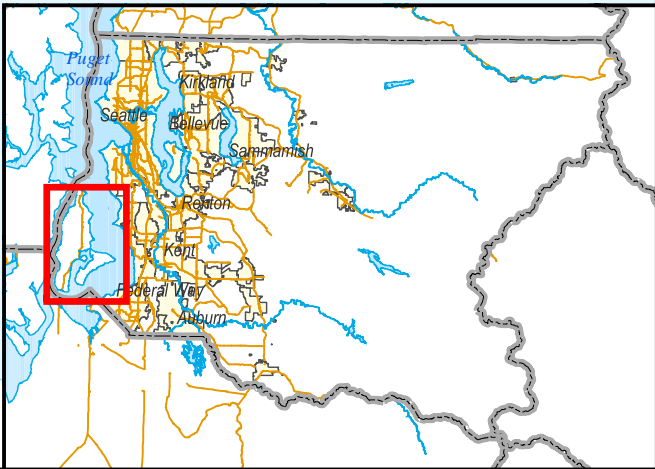
- AgB, ALDERWOOD GRAVELLY SANDY LOAM, 0 TO 6 PERCENT SLOPES
- AgC, ALDERWOOD GRAVELLY SANDY LOAM, 6 TO 15 PERCENT SLOPES
- AgD, ALDERWOOD GRAVELLY SANDY LOAM, 15 TO 30 PERCENT SLOPES
- AkF, ALDERWOOD AND KITSAP SOILS, VERY STEEP
- AmC, ARENTS, ALDERWOOD MATERIAL, 6 TO 15 PERCENT SLOPES
- Bh, BELLINGHAM SILT LOAM
- Cb, COASTAL BEACHES
- EvB, EVERETT GRAVELLY SANDY LOAM, 0 TO 5 PERCENT SLOPES
- EvC, EVERETT GRAVELLY SANDY LOAM, 5 TO 15 PERCENT SLOPES
- EvD, EVERETT GRAVELLY SANDY LOAM, 15 TO 30 PERCENT SLOPES
- EwC, EVERETT-ALDERWOOD GRAVELLY SANDY LOAMS, 6 TO 15 PERCENT SLOPES
- GPI, GRAVEL PIT, MINE, QUARRY
- InA, INDIANOLA LOAMY FINE SAND, 0 TO 4 PERCENT SLOPES
- InC, INDIANOLA LOAMY FINE SAND, 4 TO 15 PERCENT SLOPES
- InD, INDIANOLA LOAMY FINE SAND, 15 TO 30 PERCENT SLOPES
- KpB, KITSAP SILT LOAM, 2 TO 8 PERCENT SLOPES
- KpC, KITSAP SILT LOAM, 8 TO 15 PERCENT SLOPES
- KpD, KITSAP SILT LOAM, 15 TO 30 PERCENT SLOPES
- MPI, QUARRY
- Ma, MIXED ALLUVIAL LAND
- No, NORMA SANDY LOAM
- Or, ORCAS PEAT
- RdC, RAGNAR-INDIANOLA ASSOCIATION, SLOPING
- RdE, RAGNAR-INDIANOLA ASSOCIATION, MODERATELY STEEP
- Rh, RIVERWASH
- Sk, SEATTLE MUCK
- Sm, SHALCAR MUCK
- Ur, URBAN LAND
- W, Water

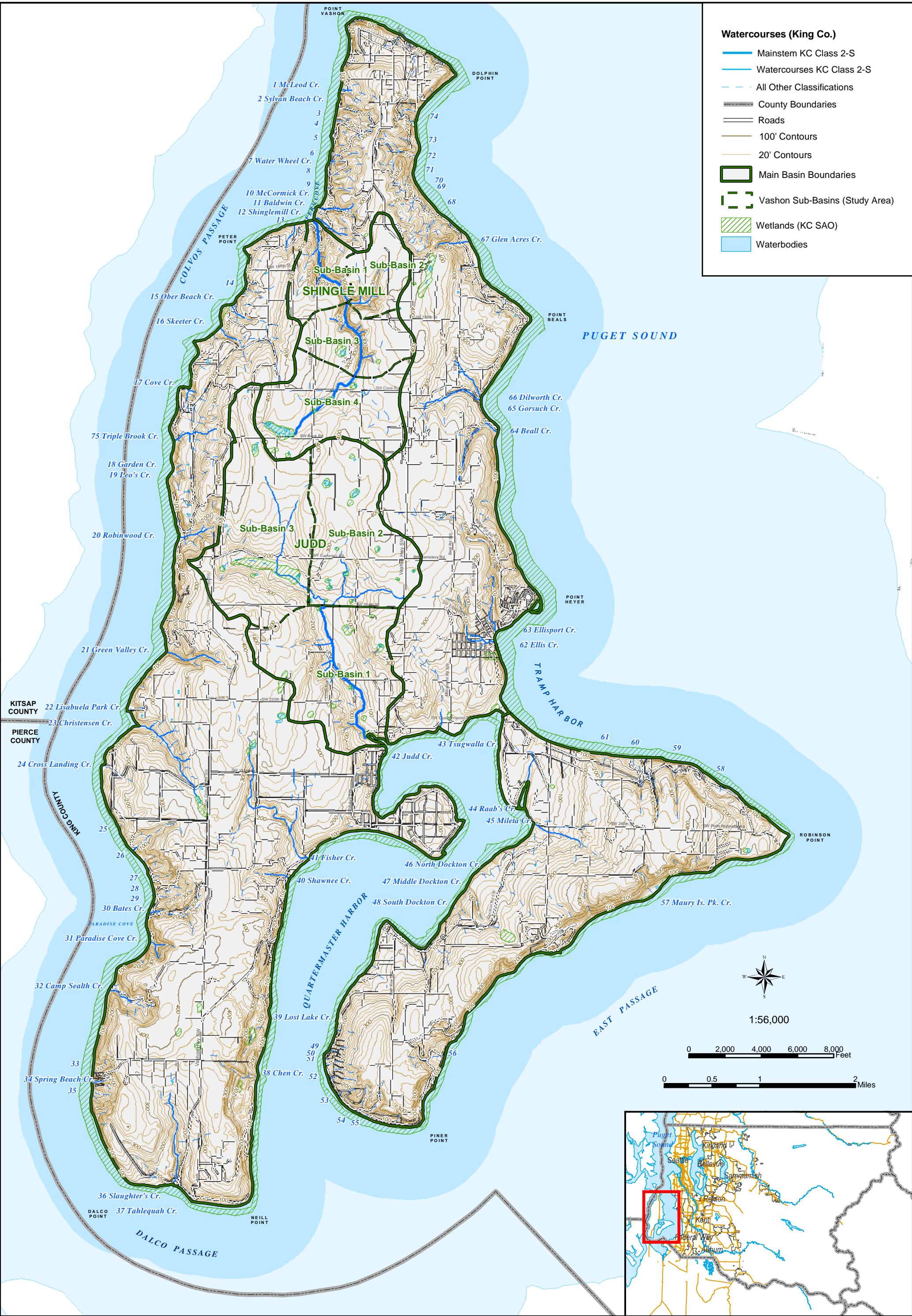


1:56,000

0 2,000 4,000 6,000 8,000 Feet

0 0.5 1 2 Miles





| TABLE 2-4. EFFECTIVE IMPERVIOUS AREA ASSIGNMENT | |
|--|------|
| Land Cover Type | EIA |
| Urban/High Density Developed | 75% |
| Mixed Urban/Low Density Developed | 8% |
| Bare Earth | 3% |
| Conifer Forest | 0.5% |
| Deciduous Forest | 0.5% |
| Mixed Forest | 0.5% |
| Recent Clearcuts | 2% |
| Recent Regenerated Forest | 1% |
| Herbaceous Vegetation | 1% |
| Shrub/Scrub Vegetation | 1% |
| Water | 100% |

For the predevelopment condition, it was assumed that the entire basin was forested, with the exception of open water, and that all HSPF soil and slope types are the same as for existing conditions. An EIA of 0 percent was applied to all land surface types except open water that was assigned an EIA of 100 percent. Predevelopment wetland areas were based on HSPF soil types classified as saturated.

Tables 2-10, 2-11 and 2-12 summarize land surface types for predevelopment, existing, and future conditions, respectively. For the future condition, it was assumed that sensitive areas (wetlands, salmon bearing streams, steep slopes, etc.) and their buffers would not be developed. For these areas, EIA values for 2001 land cover were applied. For areas outside of sensitive areas, EIA values for zoning categories described above were applied. In areas zoned Rural-Residential (RA-2.5, RA-5 and RA-10), an assumption of 10 percent forest cover retention under future conditions was applied prior to calculating future EIA.

TABLE 2-5.
EFFECTIVE IMPERVIOUS AREA BY ZONING CODE

| Zoning Code | Description | EIA |
|-------------|------------------------------|-------|
| A-10 | Agriculture – 10 ac lot | 1.0% |
| A-35 | Agriculture – 35 ac lot | 1.0% |
| F | Forest | 0.0% |
| M | Mineral | 30.0% |
| RA-2.5 | Rural Area – 2.5 ac lot size | 4.0% |
| RA-5 | Rural Area – 5 ac lot size | 4.0% |
| RA-10 | Rural Area – 10 ac lot size | 2.0% |
| UR | Urban Reserve | 10.0% |
| R-1 | Urban Residential – 1 du/ac | 4.0% |
| R-4 | Urban Residential – 4 du/ac | 26.4% |
| R-6 | Urban Residential – 6 du/ac | 33.0% |
| R-8 | Urban Residential – 8 du/ac | 48.0% |
| NB | Neighborhood Business | 85.0% |
| CB | Community Business | 85.0% |
| RB | Regional Business | 85.0% |
| O | Office | 85.0% |
| I | Industrial | 85.0% |
| ROW | Right-of-way | 85.0% |

TABLE 2-6.
SOIL TYPE TRANSFORMATION FOR HSPF

| Soil Name (NRCS Soils) | HSPF Soil Type |
|---|----------------|
| Alderwood And Kitsap Soils | Till |
| Alderwood Gravelly Sandy Loam | Till |
| Alderwood Gravelly Sandy Loam | Till |
| Alderwood Gravelly Sandy Loam | Till |
| Bellingham Silt Loam | Till |
| Coastal Beaches | Saturated |
| Everett Gravelly Sandy Loam, 0 to 5% Slopes | Outwash |
| Everett Gravelly Sandy Loam, 5 to 15% Slopes | Outwash |
| Everett-Alderwood Gravelly Sandy Loams, 6 to 15% Slopes | Outwash |
| Indianola Loamy Fine Sand, 0 to 4% Slopes | Outwash |
| Indianola Loamy Fine Sand, 15 to 30% Slopes | Outwash |
| Indianola Loamy Fine Sand, 4 to 15% Slopes | Outwash |
| Kitsap Silt Loam, 2 to 8% Slopes | Till |
| Norma Sandy Loam | Till |
| Orcas Peat | Saturated |
| Ragnar-Indianola Association, Sloping | Outwash |
| Riverwash | Saturated |
| Seattle Muck | Saturated |
| Water | Water |

TABLE 2-7.
SLOPE CATEGORY EQUIVALENCY FOR HSPF

| Percent Slope | HSPF Slope |
|---------------|------------|
| 0-10 | Flat |
| 10-20 | Moderate |
| 20-30 | Steep |
| 30-40 | Steep |
| >=40 | Steep |
| no data | Moderate |

TABLE 2-8.
NUMBER OF UNIQUE LAND SURFACE TYPES

| Subbasin | Number of HSPF Land Surface Types |
|--------------------------------|-----------------------------------|
| Judd Creek Basin | |
| 1 | 39 |
| 2 | 27 |
| 3 | 27 |
| Shinglemill Creek Basin | |
| 1 | 17 |
| 2 | 14 |
| 3 | 26 |
| 4 | 25 |

TABLE 2-9.
LAND SURFACE TYPES FOR HSPF

| HSPF Category | Description |
|---------------|--------------------------------|
| TF/Mild | Till Forest Mild Slope |
| TF/Moderate | Till Forest Moderate Slope |
| TF/Steep | Till Forest Steep Slope |
| TG/Mild | Till Grass Mild Slope |
| TG/Moderate | Till Grass Moderate Slope |
| TG/Steep | Till Grass Steep Slope |
| OF | Outwash Forest |
| OP/Mild | Outwash Pasture Mild Slope |
| OP/Moderate | Outwash Pasture Moderate Slope |
| OP/Steep | Outwash Pasture Steep Slope |
| OG | Outwash Grass |
| Saturated | Wetlands |
| Impervious | Impervious |

TABLE 2-10.
PREDEVELOPED LAND SURFACE SUMMARY BY SUBBASIN

| Land Surface | Area (acres) | | | | | | | | |
|--------------|------------------|---------------|-----------------|-----------------|-------------------------|---------------|---------------|---------------|-----------------|
| | Judd Creek Basin | | | | Shinglemill Creek Basin | | | | |
| | 1 | 2 | 3 | Total | 1 | 2 | 3 | 4 | Total |
| TF/Mild | 266.93 | 817.86 | 761.25 | 1,846.04 | 124.67 | 258.89 | 309.55 | 743.90 | 1,437.01 |
| TF/Moderate | 191.84 | 25.50 | 176.84 | 394.18 | 88.52 | 28.56 | 43.58 | 33.49 | 194.15 |
| TF/Steep | 40.18 | 0 | 5.55 | 45.73 | 101.69 | 22.94 | 44.55 | 0 | 169.18 |
| OF | 568.97 | 149.08 | 270.07 | 988.12 | 0 | 0 | 20.56 | 7.08 | 27.64 |
| Saturated | 12.33 | 0 | 0 | 12.33 | 0.65 | 0 | 0 | 12.61 | 13.26 |
| EIA | 0 | 5.70 | 0 | 5.70 | 0 | 0 | 0.32 | 4.29 | 4.61 |
| Total | 1,080.25 | 998.14 | 1,213.71 | 3,292.10 | 315.53 | 310.39 | 418.56 | 801.37 | 1,845.85 |

TABLE 2-11.
EXISTING (2001) LAND SURFACE SUMMARY BY SUBBASIN

| Land Surface | Area (acres) | | | | | | | | |
|--------------|------------------|---------------|-----------------|-----------------|-------------------------|---------------|---------------|---------------|-----------------|
| | Judd Creek Basin | | | | Shinglemill Creek Basin | | | | |
| | 1 | 2 | 3 | Total | 1 | 2 | 3 | 4 | Total |
| TF/Mild | 154.74 | 487.97 | 636.55 | 1,279.26 | 95.13 | 170.33 | 236.73 | 455.38 | 957.57 |
| TF/Moderate | 169.53 | 15.17 | 148.12 | 332.82 | 86.95 | 27.59 | 42.15 | 24.18 | 180.87 |
| TF/Steep | 36.93 | 0 | 5.19 | 42.12 | 100.40 | 22.49 | 43.02 | 0 | 165.91 |
| TP/Mild | 88.59 | 262.19 | 54.18 | 404.96 | 8.00 | 76.46 | 55.00 | 193.68 | 333.14 |
| TP/Moderate | 14.89 | 9.94 | 11.44 | 36.27 | 0.97 | 0.76 | 1.07 | 3.94 | 6.74 |
| TP/Steep | 2.90 | 0 | 0 | 2.90 | 0.51 | 0.30 | 1.29 | 0 | 2.10 |
| TG/Mild | 19.46 | 43.77 | 49.95 | 113.18 | 19.14 | 9.54 | 14.03 | 73.62 | 116.33 |
| TG/Moderate | 5.84 | 0.20 | 14.60 | 20.64 | 0.13 | 0.07 | 0.12 | 4.59 | 4.91 |
| TG/Steep | 0.13 | 0 | 0.31 | 0.44 | 0.26 | 0.05 | 0 | 0 | 0.31 |
| OF | 493.42 | 81.19 | 250.14 | 824.75 | 0 | 0 | 8.82 | 5.54 | 14.36 |
| OP/Mild | 30.91 | 43.26 | 1.76 | 75.93 | 0 | 0 | 6.86 | 0.73 | 7.59 |
| OP/Moderate | 16.27 | 0.20 | 3.97 | 20.44 | 0 | 0 | 2.18 | 0 | 2.18 |
| OP/Steep | 0.35 | 0 | 0 | 0.35 | 0 | 0 | 0.90 | 0 | 0.90 |
| OG | 22.71 | 20.34 | 11.76 | 54.81 | 0 | 0 | 1.49 | 0.71 | 2.20 |
| Saturated | 12.26 | 0 | 0 | 12.26 | 0.61 | 0 | 0 | 12.43 | 13.04 |
| EIA | 11.28 | 33.91 | 25.72 | 70.91 | 3.43 | 2.80 | 4.90 | 26.57 | 37.70 |
| Total | 1,080.25 | 998.14 | 1,213.71 | 3,292.10 | 315.53 | 310.39 | 418.56 | 801.37 | 1,845.85 |

TABLE 2-12.
FUTURE BUILDOUT LAND SURFACE SUMMARY BY SUBBASIN

| Zoning | Area (acres) | | | | | | | | |
|---|------------------|---------------|-----------------|-----------------|-------------------------|---------------|---------------|---------------|-----------------|
| | Judd Creek Basin | | | | Shinglemill Creek Basin | | | | |
| | 1 | 2 | 3 | Total | 1 | 2 | 3 | 4 | Total |
| A-10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12.07 | 12.07 |
| RA-2.5 | 8.27 | 0 | 5.18 | 13.45 | 18.31 | 20.80 | 38.65 | 0 | 77.76 |
| RA-5 | 451.89 | 473.07 | 686.61 | 1,611.56 | 73.80 | 251.79 | 235.43 | 420.12 | 981.14 |
| RA-10 | 484.32 | 257.74 | 372.99 | 1,115.05 | 170.69 | 0 | 81.82 | 190.52 | 443.03 |
| R1 | 0 | 36.79 | 0 | 36.79 | 0 | 0 | 0 | 1.74 | 1.74 |
| R4 | 0 | 8.23 | 0 | 8.23 | 0 | 0 | 0 | 41.70 | 41.70 |
| R8 | 0 | 1.07 | 0 | 1.07 | 0 | 0 | 0 | 11.30 | 11.30 |
| NB | 0 | 3.64 | 0 | 3.64 | 0 | 0 | 0 | 0 | 0 |
| CB | 0 | 9.45 | 0 | 9.45 | 0 | 0 | 0 | 16.29 | 16.29 |
| O | 3.70 | 0 | 0 | 3.70 | 0 | 0 | 0 | 0 | 0 |
| I | 0 | 82.82 | 0 | 82.82 | 0 | 0 | 0 | 0 | 0 |
| ROW | 26.27 | 33.05 | 32.30 | 91.62 | 8.07 | 8.03 | 7.97 | 33.53 | 57.60 |
| Sensitive Areas | 105.80 | 92.27 | 116.64 | 314.71 | 44.80 | 29.77 | 54.69 | 74.09 | 203.35 |
| Total | 1,080.25 | 998.14 | 1,213.71 | 3292.10 | 315.53 | 310.39 | 418.56 | 801.37 | 1,845.85 |
| EIA (included in above zoning categories) | 51.75 | 137.41 | 61.38 | 250.54 | 13.63 | 17.14 | 19.01 | 79.33 | 129.11 |

2.2.5 Riparian Corridor Land Cover Analysis

A 200-foot-wide stream riparian corridor, shown in Figure 2-8, was analyzed using GIS data for existing land use. Table 2-13 summarizes the existing land cover within this corridor by subbasin. Future land cover in the corridor was not analyzed because it was not feasible to accurately predict the spatial distribution of future development in and along the corridor. It is assumed that sensitive-area regulations will protect the stream corridor in the future.

2.3 Conclusions and Recommendations

Basin characteristics were derived from GIS data provided by King County. The effective impervious area was derived from a range of values provided by the County based on land use or zoning. In order to develop a more accurate representation of cover types and EIA it is recommended that this information be developed from current orthophotos of the basin that could be digitized and specific areas computed.

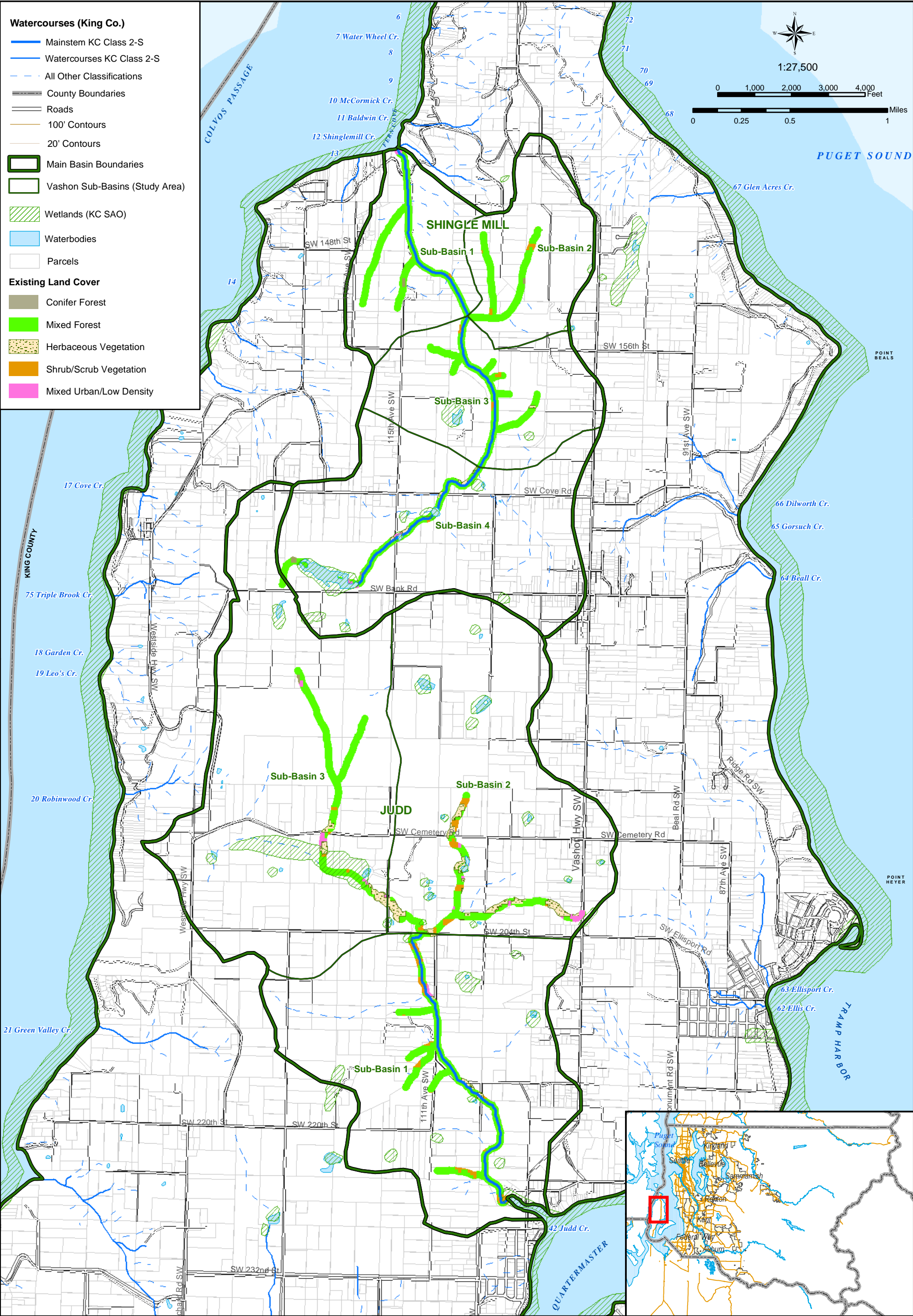


TABLE 2-13.
EXISTING (2001) LAND SURFACE SUMMARY BY SUBBASIN FOR 200-FOOT RIPARIAN CORRIDOR

| Land Cover Type | Area (acres) | | | | | | | Total |
|-------------------------|------------------|------|-------|-------------------------|------|-------|-------|--------|
| | Judd Creek Basin | | | Shinglemill Creek Basin | | | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | 4 | |
| Coniferous Forest | — | — | 0.39 | 0.01 | — | — | 0.76 | 1.16 |
| Herbaceous Forest | 1.78 | 3.29 | 5.18 | — | — | — | 2.80 | 13.05 |
| Mixed Forest | 33.53 | 4.15 | 28.30 | 23.58 | 0.11 | 19.88 | 26.99 | 136.54 |
| Mixed Urban/Low Density | 0.54 | 0.02 | 2.00 | 0.72 | — | — | 2.45 | 5.73 |
| Scrub/Shrub | 5.43 | 0.41 | 0.86 | 0.22 | | 0.83 | 1.68 | 9.43 |
| Total | 41.28 | 7.87 | 36.73 | 24.53 | 0.11 | 20.71 | 34.68 | 165.91 |